

Chrysalis.—Compact, fairly cylindrical, narrower cephalad ; rounded, bluntly-tapering caudad. Truncated in the dorso-cephalic plane. Mesothorax with a low median dorsal prominence. Cremasteric area circular, provided with numerous minute hooklets, the latter with two curved prongs.

The chrysalis, except over wing, tongue, leg and eye-cases, is entirely covered with minute processes. Under magnification (55 diam.) these are seen to be wine-glass-shaped, the rims made up of tiny finger-like projections extending upwards and outwards in a circle. I could discover no hairs on the surface of the chrysalis, these processes evidently replacing them.

The colour is very variable, hardly any two alike ; often some shade of green (nile, blue, pale or merely tinged), or over the green on wing-cases and dorsum there may be a slight sprinkling of black or brown atoms, which may increase until the whole chrysalis is well covered with atoms and blotches, or the green may be lacking, and the colour then is black or brown (Roman sepia), or even as in one case, a purple-madder. The substigmatal and the two lateral, wavy, white bands of the caterpillar can sometimes be traced in the chrysalis, varying in colour, of course, sometimes white (particularly with the green forms), again as rows of black or brown specks.

The spiracles are white, with a faint yellowish tinge ; thoracic elongate-oval, abdominal oval.

Length, 8.5 mm. to 10.25 mm. Greatest width about 4 mm. at tips of wing-cases.

THE CHALCIDOID PARASITES OF THE COCCID *KERMES PUBESCENS* BOGUE, WITH DESCRIPTIONS OF TWO NEW GENERA AND THREE NEW SPECIES OF ENCYRTINÆ FROM ILLINOIS.

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From a single small lot of specimens of this common coccid of the oak—*Kermes pubescens* Bogue—gathered from the twigs of a single tree on the campus of the University of Illinois at Urbana, during the summer of 1908, the following chalcidoid parasites were reared, several of which appear to be undescribed. The oak was a species of the *alba* group. So far, I believe, but a single parasite of this coccid has been recorded in the literature ; this paper adds at least three others, two representing new genera, and all belonging to a single subfamily, the Encyrtinæ.

May, 1911

Associated with the three encyrtinines reared here in Illinois, however, were found certain chalcidoids of the family Pteromalidæ, tribe Pachyneurini, genus *Pachyneuron* Walker, and of the family Eulophidæ, subfamily Tetrastichinæ, genus *Gyrolasia* Foerster, which are perhaps secondary in their relations, or may have come from some syrphid larva in among the hosts. The first was *Pachyneuron micans* Howard, and the second an apparently undescribed species of the eulophid genus mentioned (but without long marginal fringes of the fore wings), allied with (*Syntomosphyrum*) *Gyrolasia esurus* (Riley), differing from that species in having more slender veins in the fore wings. For the present it is left undescribed. These two species are not listed below (Accession Nos. 44,226 and 44,227, Illinois State Laboratory of Natural History, Urbana, Illinois, two males, one female and two females respectively, all on tags, and a slide for each species).

For the authoritative identification of the host I am indebted to Professor T. D. A. Cockerell, University of Colorado, Boulder, Colorado.

Family ENCYRTIDÆ.

Subfamily ENCYRTINÆ.

Tribe *Ectiromini*.

Cristatithorax, genus novum.

Normal position.

Female.—Head lenticular, not quite as wide as the thorax at its widest point, the facial impression rather small, not prominent, its caudal margin acute, yet not sharply defined by an arched carina, the convexed discal portion with moderately large, scattered punctures, bearing setæ; scrobes short, forming a semicircle; face between the eyes and the vertex hexagonally sculptured or rugose, the eyes margined with a row of moderately large punctures, each puncture giving origin to a single grayish seta; impression of the face from cephalic aspect (natural position) elliptical, less than one-half the length of the head; face beneath the eyes glabrous; vertex rather narrow, the eyes somewhat convergent above, the lateral ocelli touching the eye margin, the ocelli in an acute-angled triangle; cheeks finely rugose; antennæ inserted at the clypeal border, compressed, clavate, with no sharp demarkation between the funicle and club, the flagellum gradually enlarging, the scape slightly dilated towards apex, the funicle 6-jointed, longer than the club, and with the first joint shorter than the pedicel; mesothorax finely reticulated, with a squammose appearance,

the scutum with some large punctures, which are scattered and inconspicuous, and clothed with short stiff prostrate gray or silvery hairs, which, however, are absent at the meson of the caudal three-fourths of the sclerite and along the caudal margin, some distance laterad from the meson; scutum and scutellum subequal in length, the latter slightly longer; axillæ cuneate, joining at base of scutellum; scutellum with a conspicuous tuft of black hairs at its dorsal apex. Abdomen conic-cylindric, equal to combined length of head and thorax, the hypopygium prominent, extending one-fifth the length of the abdomen beyond the anal extremity. Wings infuscated beyond the submarginal vein, with the extreme apex hyaline however; marginal vein slightly thickened, linear, thrice the length of the stigmal vein, which is nearly twice the length of the postmarginal vein, the latter distinct; a short V-shaped, hyaline, hairless marking present, its apex along the costal margin just beyond the postmarginal vein, one branch running slightly apico-caudad (normal position) across the truncate end of the stigmal vein, the other proximo-caudad, into the angle subtended by the junction of the stigmal and postmarginal veins; also an oblique (meso- or proximo-caudad) hairless line running from the stigma, but included within the coloured area of the fore wing, and hence somewhat obscured. Marginal cell of hind wings long. Wings extending beyond abdomen, and slightly beyond the hypopygium. Legs normal. Mandibles bidentate, the outer tooth shorter, obtuse, and one-third as broad as the inner, which is broadly truncate at apex.

Nearest to *Chrysopophagus* Ashmead, and separated from it by the slightly dilated scape, the longer pedicel, the less noticeable compression of the antennæ, and the differently shaped, more rounded head, and by mandibular characters, the mandibles in *Chrysopophagus* being distinctly 3-dentate, the two inner (mesal) teeth being equal and slightly smaller than the outer (lateral) one, and less acute. And liable to be confused with *Habrolepis* Foerster and *Eusemion* Dahlbom, of the tribe Mirini.

(Type: *C. pulcher*, species nova, described in following.)

1. *Cristatithorax pulcher*, species nova.

Normal position.

Female.—Length, 1.35 mm. Moderate for the tribe. Submetallic; varicoloured. General colour dark chrome-yellow. Cheeks bordering the eyes, face below the eyes, and a portion of the convex disk of the facial impression, mesoscutum, dorsum of the metathorax, the whole of the abdomen, excepting base of venter and the exerted portion of the hypopygium, which is white, caudal portions of the thoracic pleurum, dark

purplish, with a metallic lustre, especially at the dorsum of the abdomen. Eyes dark, prominent; ocelli ruby red, with some yellow.

Antennæ black, the middle or intermediate longitudinal portion of the sides of the scape silvery white, the white stripe reaching the margin at apex, at the dilation. Head, prothorax, scutellum, ventral base of abdomen, thoracic pleuræ and venter dark chrome-yellow, the axillæ still darker, the vertex and face with some traces of a purplish sheen. Legs dark yellowish, with some purplish above, the intermediate femora with a white annulus near the apex; tarsi yellowish, the posterior pair white, with two apical joints dusky. Distal two-thirds of the wing fuliginous, the extreme apex and the basal third hyaline; in reflected light wings purple; sooty colour more pronounced in a small triangular area between the indistinct oblique hairless line and the marginal vein, and less so in the portion of the wing included between the marginal vein and the posterior margin; a somewhat irregular longitudinal lighter area in the middle of the wing, near the posterior margin. Hind wings hyaline.

Antennæ 11-jointed; scape longer than the combined lengths of the pedicel and first two funicle joints; pedicel obconic, longer than the funicle joint 1; funicle gradually, regularly enlarging to club; funicle joints 1 and 2 subequal, 1 slightly narrower and longer; funicle joints 3 and 4 subequal, larger, 4 somewhat larger than 3; joints 4 and 5 of funicle subequal, 4 slightly smaller, both still larger than 3 and 4, and wider than long; club joints slightly wider than joints 5 and 6 of funicle, the basal joint subquadrate, the two apical joints narrow, much wider than long.

(From two specimens, two-thirds-inch objective, two-inch optic. Bausch and Lomb.)

Male.—Unknown.

This species is superficially like *Chrysopophagus compressicornis* Ashmead. Described from two tag-mounted females reared from *Kermes pubescens* Bogue, on oak, Urbana, Illinois, July 1, 1908.

Type: Accession No. 37.590, Illinois State Laboratory of Natural History, Urbana, Illinois, one female, tag mounted; head and antenna (1 slide) and antenna (1 slide), both in xylol-balsam.

Tribe *Mirini*.

Enasioidea, genus novum.

Normal position.

Female.—Length moderate for the tribe.

Head (cephalic aspect) rounded triangular, longer than wide, not lenticular, the facial impression weak, bounded by the antennal scrobes which form a rounded triangular impression, surrounding on two sides the raised cuneate disk of the facial impression; the apex of the scrobes obtuse, reaching to a point midway between the eyes (cephalic aspect); the whole of the cephalic aspect of the head and the vertex closely, but not very coarsely, punctured, the surface slightly less rough than the eye surface; ocelli in an almost equilateral triangle, the lateral ones slightly farther apart from each other than each is from the cephalic ocellus, and close to, but not touching, the eye margin, and still farther from the occipital margin; eyes large, round, prominent on the dorso-lateral aspect of the vertex, and prominent from both dorsal and cephalic aspects, somewhat convergent from dorsal aspect, and from lateral aspect not as long as the cheeks or malar space, regularly convex, lenticular, and reaching caudad to the convexed, acute occipital margin; from dorsal aspect vertex an inclined plane; the occipital foraminal depression almost acutely concave; face with some sparse grayish hairs; antennæ inserted far below the middle of the face, the scape with a large leaf-like dilation ventrad, the pedicel longer than the first funicle joint, the funicle 6-jointed, white, annulate with black at the first joint, cylindrical and slightly clavate, the club 3-jointed, white, ovate and distinctly wider than the funicle, but not more than one-half as long; flagellum on the whole cylindrical, subcapitate. Dorsal aspect of the surface of the thorax similar in sculpture to that of the head, the pro- and mesonotum with scattered, short, stiff, recumbent white hairs, hispid (Coddington lens, half-inch), the hairs apparently not arising from shallow, larger punctures; axillæ meeting at the meson, cuneate; along the median line scutellum somewhat longer than the mesoscutum, peltate, its cephalic margins oblique from the side to the meson, cephalo-mesad; caudal margin of the mesoscutum straight or very slightly convex; dorso-lateral aspect of the mesopostscutellum and the metanotum bare, that of the former finely, obliquely corrugated.

Abdomen short, only about two-thirds the length of the thorax, ovate, its dorsum concave and not clothed with stiff pubescence, the spiracle of the third segment dorsal, at the lateral margin prominent, fuscous, margined and guarded by about three long black setæ; hypopygium prominent, plowshare-shaped, extending distinctly beyond the abdomen. Legs normal, the middle tibial spur short and stout, not as long as the basal tarsal joint, which is by far the longest of the joints of the intermediate tarsi, the others relatively small; the bristles on the intermediate

tarsi ventrad, short, more numerous and stiffer than usual; the proximal tarsal joint of the caudal legs intermediate in size between those of the cephalic and intermediate legs, but all of the proximal tarsal joints longer than the other tarsal joints, excepting perhaps that of the cephalic legs, the apical tarsal joint next in length, the three others nearly subequal in length and shorter; caudal tibiæ with but a single short spur, the single spur of the cephalic tibiæ curved and slender, reaching nearly to the apex of the proximal tarsal joint.

Wings hyaline, both densely, closely ciliate in the disk, and the fore wings with a transverse, oblique, hairless streak, as in *Anagyryus* Howard, extending from the stigmal vein, proximo-caudad; marginal vein of fore wing punctiform, the postmarginal vein absent, the stigmal vein moderately long, straight, the submarginal vein long and slender, about five times the length of the stigmal vein, but not reaching to the middle of the costal margin. Costal cell of caudal wings extending to the hooklets. Wings relatively long. Body non-metallic, pallid ochraceous.

Mandibles 3-dentate, the outer (lateral) tooth shorter than the two inner (mesal) ones and obtuse, the two inner shallow and subequal, as if formed of a broad truncate tooth, with a concave emargination at the centre of its apical margin.

(Type: *A. laticapus*, species nova, described beyond.)

Close to *Enasius* Walker, but differing in the smaller club, the antennæ being capitate, in the longer funicle, the absence of large thimble-like depressions on the head, and the different shape of the latter, the joined axillæ, in the absence of the postmarginal vein, the hyaline wings, and in the broader pronotum and longer mesoscutum. And agreeing in some respects with *Encyrtus* Ashmead in wing and antennal characters, but the scape of the antennæ is totally different, and the body non-metallic, besides differing in habitus. The genus is liable to confusion with *Anagyryus* Howard, of the tribe *Ectromini*, but besides the 3-dentate mandibles and other tribal characters, the more reduced venation will readily distinguish it.

2. *Enasioidea laticapus*, species nova.

Normal position.

Female.—Length, 0.89 mm. General colour pallid yellowish, the head and mesonotum conspicuously light chrome-orange, the dorsal aspect of the mesopostscutellum and the metanotum, also the proximal segment of the abdomen, blackish, the pronotum dark, with a pruinose appearance, but pallid laterad; remainder of abdomen yellowish white; eyes very dark

reddish, margined dorsad, along the occipital margin, with yellowish; ocelli ruby-red, with some yellow; tegulæ pallid. Antennæ white, the dilation or exfoliation (only) of the scape, the base of the pedicel dorsad, and the first funicle joint black. Venation pallid yellowish. Legs white, with a tinge of yellowish, the apical tarsal joint darkened.

Mesopleurum slightly reticulated. Marginal cilia of fore wings short, those of the caudal margin of the caudal wings longer; stigmal vein capitate; area of the fore wing proximad of the oblique hairless line or streak densely ciliate, as in the larger portion of the wing apicad of the streak, excepting at the caudal margin, proximad; the oblique hairless streak does not extend quite to the caudal wing margin, and is broadest at its caudo-proximal end; spurious veins inconspicuous, not breaking the ciliation of the wing. Tegulæ longitudinally rugulose.

Scape as long as the pedicel, and the first three funicle joints combined; pedicel obconic, not quite twice as long as it is wide at apex, nearly as long as the combined length of the first two funicle joints, which are subequal and shortest of the antennal joints, and narrower than the apex of the pedicel; funicle gradually widening to the club; funicle joint 3 longest of the funicle joints, slightly shorter than the pedicel, wider than joint 2 and narrower than joint 4 of the funicle; the latter still longer than wide, shorter than the preceding joint but wider; funicle joints 5 and 6 subquadrate, shorter than joint 4, and distinctly narrower than the proximal club joint. Basal joint of the club longest of the three, the intermediate joint shorter but widest, and the apical joint shortest and narrowest, obtusely conical. Antennæ pubescent.

(From six specimens, two-thirds-inch objective, two-inch optic. Bausch and Lomb.)

Male.—Unknown.

Described from two tag-mounted and four slide-mounted females reared June 25th, 1908, from specimens of *Kermes pubescens* Bogue, on oak, Urbana, Illinois. Seven females reared.

Type: Accession No. 40,285, Illinois State Laboratory of Natural History, Urbana, Illinois, two females tag-mounted and four females in xylol-balsam (two slides).

Microterys Thomson.

3. *Microterys cincticornis* Ashmead.

Ashmead, 1900, p. 390. (Proc. U. S. National Mus., Washington, D. C., XXII.)

King, 1899, p. 139. (CANADIAN ENTOMOLOGIST, London, Ontario, XXXI.)

"2. *Microterys cincticornis* Ashmead, new species.

"This species probably represents a variety of the European *M. tessellatus* Dalman. It agrees with it in stature and in wing markings, except that the triangular white marginal spots are connected so as to form an additional band, while the head and thorax at sides, too, are quite differently coloured. The head, the pronotum, except above, the sides of the thorax and the legs are brownish-yellow, while the mesonotum is metallic-blue.

"*Type*: Cat. No. 4769, U. S. N. M. (Ashmead collection).

"*Habitat*: New Hampshire: Mount Washington. (Mrs. A. T. Slosson)."

George B. King, in 1899, recorded this parasite from *K. pubescens* in Massachusetts. I have not met with it in Illinois. Through the kindness of Mr. J. C. Crawford, Division of Insects, U. S. National Museum, Washington, D. C., I am able to offer the following descriptive notes on this species, taken from the type and in comparison with the two co-type females of *M. speciosissimus*, species nova, described just beyond: "*cincticornis* has the upper part of the head more reddish, the middle more yellowish; this yellowish colour shows on the back of the head and on the under parts of the insect; the scape is light—only the anterior margin is dark; the scutellum is very metallic—as much so as the mesonotum; legs all light; what I will call the middle band on the wing is dark and the apical band distinct, making the apical part of the wing darker than in your species; in your species the middle band is a series of dark spots, but in Ashmead's species these are so close together that they are hardly distinct from one another, being a band instead." (J. C. Crawford, *In litt.*, January 8, 1909.)

In *cincticornis* there is no tuft of hairs on the scutellum.

4. *Microterys speciosissimus*, species nova.

Normal position.

Female.—Length, 1.33 mm. Normal in size and shape; funicle annulate, scape greatly dilated, scutellum without a tuft of hairs at apex.

General colour ochraceous, the mesoscutum metallic dark blue, the axillæ and scutellum duller than the mesoscutum, purplish, the dorsum of the abdomen the same colour as the scutellum, with a little more blue, the abdominal ventum concolorous with the dorsum of abdomen, the cephalic and caudal margins of the pronotum nearly concolorous with the mesoscutum, leaving a narrow transverse intermediate portion ochraceous,

but which, however, widens at the lateral third, extending cephalad, laterad and caudad to the respective margins; metanotum concolorous with the scutellum, excepting dorso-laterally, where it is ochraceous; tegulae ochraceous, obscured in the disk with some bluish; clypeus conspicuously dark brown, from side to side; head between the vertex and front, between the eyes, variable, frequently tinged with lustrous purple, visible in certain lights only; legs ochraceous, the caudal femora and tibiae, however, flushed with bluish, the intermediate tibiae more delicately so, the apical tarsal joint dark; antennae black, the 5th and 6th funicle joints white; scape at the peduncle and extreme apex ochraceous, and the pedicel and first two funicle joints dusky, lighter ventrad; dilatation of the scape somewhat metallic and with some bluish. Fore wings fuliginous to end of the stigmal vein, the apical margin of the fuliginous area convex; from thence apicad, hyaline, but through the midst of this, nearer the fuliginous area than to the apex of the wing, runs transversely (cephalo-caudad) a broken band of fuliginous, consisting of four distinct portions, two subequal subquadrate spots leading caudo-apicad from the cephalic wing margin, a smaller rounder dot in the middle of the wing, further proximad, and then leading to the caudal margin, apico-caudad, a longer columnar area; if joined together the line formed would be ξ -shaped; venation brownish-black. Eyes dark; ocelli ruby-red.

Head slightly wider than long (cephalic aspect), sublenticular, as wide as the thorax at its widest point, from lateral apex deflexed, the facial impression normal and margined caudad, the scrobes forming a semicircle, the mesal portion of the impression carinated for a short distance along the median line near the caudal margin. Face between the eyes and the vertex as in *Cristatithorax pulcher* Girault. Eyes nearly circular, their mesal margin somewhat flattened, rather large and on the cephalo-lateral aspect of the head, their caudal margins invading the sharp occipital margin; ocelli not near the occipital margin, in a nearly equilateral triangle, the lateral ones oval and nearly touching the eye margins, and slightly nearer to each other than either is to the cephalic ocellus, which is circular. Occipital margin acute, convex. Pro- and mesonotum and the mesopleurum squammose, the two former with regularly scattered, obscure punctures, which are less conspicuous on the scutellum and axillae, each puncture giving origin to a reclinate, short, dull grayish seta; meso-scutum slightly shorter than the scutellum along the meson, its caudal margin regularly convex; axillae acutely cuneate, meeting at the meson, where they are subaccuminate; scutellum peltate, normal, without a tuft

of bristles, its cephalic margin angularly convex, subacute at the meson. Metanotum normal. Abdomen short and stout, subtriangular, not quite as long as the thorax, flat dorsad and not pubescent, shining, but with the squammose sculpture of the thorax, which, however, is more delicate on the abdomen. Sheaths of the ovipositor slightly exerted, ochraceous. Fore and hind wings densely ciliate in the disk; marginal vein of the fore wing short and thick, but slightly longer than wide, the stigmal vein nearly as long as the marginal and postmarginal veins combined; the latter slightly shorter than the marginal vein; fore wings extending for nearly one-half their length beyond the abdomen; a subcuneate hairless line with its apex just caudad of the stigmal vein runs from that vein cauda-proximad through the fuliginous area to the caudal wing margin, where it is widest; this hairless line is not conspicuous; joining it, or originating from it, near the caudal margin, is a narrow, curved white line, which runs apicad through the fuliginous area to its apical margin, where it splits into two; also, this line is not very conspicuous. There is also in the fore wing an inconspicuous, more deeply-coloured spot beneath the submarginal vein, just proximad of the oblique hairless line, and running somewhat parallel to it. Immediate base of fore wing naked.

Antennæ 11-jointed, inserted at the clypeal border; scape with a conspicuous, dorso-ventral, leaf-like dilatation or expansion, the dilatation appearing just beyond a short peduncle and extending to the apex, and of itself hemi-pyriform; scape longer than pedicel and joints 1 and 2 of funicle combined, the expansion with some punctures; flagellum normal, cylindrical and regularly clavate, and the club normal. Pedicel obconical, longer than any of the following joints, and slightly shorter than the combined lengths of joints 1 and 2 of the funicle; first funicle joint two-thirds the length of the pedicel, and slightly shorter and narrower than funicle joint 2; funicle joints 2 and 3 subequal, joint 3 slightly thicker, both longer than joint 1, and still more so than the three following joints; joints 4, 5, 6 of the funicle quadrate, subequal, one-third shorter and wider than joint 3; the club regularly conical, about the same length as the combined lengths of joints 4, 5 and 6 of the funicle, its basal joint one-third longer and slightly wider than funicle joint 6, and as long as, and much wider than, funicle joint 3; the intermediate joint is one-third shorter and slightly narrower than the basal joint, and narrows cephalad; the apical joint of the club conic, equal in length to the basal joint. Antennæ hispid.

Mandibles 3-dentate, the two inner (mesal) teeth, however, shallow, equal, and taken together like a single broad tooth notched at the centre of its apical margin; the outer (lateral) tooth acute, but very slightly longer.

(From eight specimens, two-thirds-inch objector, two-inch optic. Bausch and Lomb.)

Male.—Unknown.

This beautiful species was described from eight females reared June 23 (seven ♀s) and July 7th, 1908 (one ♀) from the same lot of *Kermes pubescens* Bogue.

Types: Accession Nos. 37,561 (five ♀s, tag-mounted) and 37,593 (♀ head and antenna, one slide, xylol-balsam), Illinois State Laboratory of Natural History, Urbana, Illinois. *Co-type*: No. 12,166, United States National Museum, Washington, D. C., two ♀s, tag-mounted.

A NEW ALASKAN MOSQUITO.

BY C. S. LUDLOW,

Army Medical Museum, Washington, D. C.

For several years there appeared in the collections of mosquitoes from Alaska what were evidently two distinct species, but in such bad condition that it was impossible to be sure just what the differences were. Now, after some four years of indcision, specimens have been received that allow of differentiation and description, and I give below the description of what seems to be a new species:

Culex borealis, n. sp.

Female.—Head very dark brown, covered with broad, curved ochraceous scales in a comparatively narrow median space from vertex to occiput, broad, flat ochraceous scales laterad and extending as lateral scales, a few fork scales, light and dark, at the nape; brown bristles projecting forward over and between the eyes; antennæ brown, verticels brown, pubescence light, basal joint testaceous, with flat pale ochraceous scales on the median aspect; palpi dark brown, with a very few light scales, mostly on the ventral side; proboscis very long (about seven times longer than the palpi), almost black; eyes reddish-brown; clypeus dark, and in some specimens the contiguous mouth-parts much distended, rather pouch-like on the ventral side.

Thorax: Prothoracic lobes dark, with pale ochraceous flat scales; mesothorax very dark, covered with large curved scales, a narrow median